Claims (Alternative petition, amended Claim 1)

1. Method for monitoring and controlling a number of available decentralized IP budgets of a subscriber in a packet-based communications network during an online assessment of charges for data transmissions, in which the plurality of available IP budgets are each allocated in a data-flow-specific manner to a data flow in a context that can be assigned to the subscriber, and a higher-order control function is provided in a network node of the communications network, said control function charging the data-flow-specific IP budget according to a resource use of a data flow based on charge assessment specifications issued by a charge-assessing computer during a resource utilization of the data flow in a context that can be assigned to the subscriber, and effecting a partial or complete transmission of the IP budget between selected data flows on a case-by-case basis, whereby the control function effects a reallocation or transfer of the IP budget according to the specifications of the charge-assessing computer.

2. Method according to Claim 1,
characterized in that
when a data flow is added or removed, the charge assessing computer or the control function requests the return of all allocated IP budgets according to the charge assessment specifications of the charge-assessing computer and reallocates the IP budgets.

3. Method according to one of the above claims,
characterized in that
the charge assessing computer or the control function requests the return of all allocated IP budgets at a point in time specified by the charge-assessing computer according to the

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charge assessment specifications of the charge-assessing computer, and reallocates the IP budgets.

4. Method according to one of the above claims,
characterized in that
some or all of the data-flow-specific IP budget of a first data flow is only transferred by the control unit according to the charge assessment specifications of the charge assessing computer to a second data flow if a data-flow-specific IP budget allocated to the second data flow reaches a threshold value or is completely used up.

5. Method according to one of the above claims,
characterized in that
some or all of the data-flow-specific IP budget of a first data flow is only transferred by the control unit to a second data flow if the second data flow belongs to a context that can be allocated to an IP address of the same subscriber.

6. Method according to one of the above claims,
characterized in that
some or all of the data-flow-specific IP budget of the first data flow is only transferred by the control unit to a second data flow if the second data flow belongs to a context that can be allocated to the same IP address of the subscriber.

7. Method according to one of the above claims,
characterized in that
some or all of the data-flow-specific IP budget of a first data flow is only transferred by the control unit to a second data flow if the second data flow belongs to the same context as the first data flow.

8. Method according to one of the above claims,
characterized in that
the charge-assessing computer issues a transfer authorization,
within the charge assessment specifications, between a first
and a second data flow by marking the first and the second
data flow with a common identifier.

9. Method according to one of the above claims,
characterized in that
a data-flow-specific weighting factor is specified by the
charge-assessing computer for charge assessment of a data
flow.

10. Method according to Claim 9,
characterized in that
a data-flow-specific weighting factor is specified by the
charge-assessing computer for charge assessment of a data flow
by means of a table or pointer to a position in a table.

11. Method according to one of the above claims,
characterized in that
a GPRS network is used as the packet-based communications
network.

12. Method according to Claim 11,
characterized in that
the control function is located in a GGSN.

13. Method according to one of the above claims,
characterized in that
the control function requests the return of the IP budgets of
all other data flows when a threshold value of a data-flow-
specific IP budget of any data flow is reached, and transfers

them to the charge assessing computer.

14. Method according to one of the above claims,
characterized in that
part of a data-flow-specific IP budget of a data flow
terminated by the subscriber is transferred by the control
function to one or more existing or new data flows.

15. Method according to one of the above claims,
characterized in that
when a new data flow is added by the control function
according to the charge assessment specifications of the
charge-assessing computer, at least part of the IP budget of
at least one existing data flow is transferred to the new data
flow.

Description

Method for monitoring and controlling a number of available
decentralized IP budgets of a subscriber in a packet-based
communications network during an online assessment of charges
with limit value monitoring for data transmissions

WO02/096025A discloses a packet-based communications network
in which value-added services are implemented and assessed for
charges.

US-A-995 822 discloses a performance-based communications
network in which a number of separate circuit-switched
telephone connections of a subscriber may be assessed for
charges online.

The invention relates to a method for monitoring and
controlling a number of available decentralized IP budgets,
such as - for example - time, transmission volume, number of
packets, of a subscriber in a packet-based communications
network during an online assessment of charges with limit
value monitoring for data transmissions. Communication
procedures that are based on the transmission of data packets
(e.g. IP packets, IP = Internet Protocol) are often used in
wireless and wired communications networks. These procedures
are therefore known as packet-based communications networks. A
packet-based communications network may, for example, be a
third-generation mobile telephone network, which operates
according to GPRS specifications (GPRS = General Packet Radio
System). In packet-based mobile telephone networks, call
charge registration is based - among other things - on
registration of the IP packets transmitted. These charges are
calculated from the total volume of IP packets transmitted to

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and from a subscriber, the number of IP packets, or the number of data bytes. The charges may also be determined on the basis of the transmission time. This use of resources is referred to in this invention as the IP budget. Existing online charge services for GPRS are based on monitoring of the IP budget within a PDP context. A PDP context is an example of a so-called Layer 2 connection from a subscriber to the communications network. All charge-related data that refers to a context is registered and compared to an IP budget specified